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The years of the nineteenth century having A for their Dominical Letter were: 1809, 1815, 1820, 1826, 1837, 1843, 1848, 1854, 1865, 1871, 1876, 1882, 1893, the Epacts for which are 14, 20, 15, 22, 23, 0, 25, 1, 3, 9, 4, 11, 12.

Of these the years admissible must have the Epacts 24, 25, 26, 27, one only meeting the conditions, viz., 1848.

Also solved by J. Scheffer, and A. H. Holmes.

236. Proposed by L. SHIVELY, Mt. Morris College, Mt. Morris, Ill.

Sum to infinity the series  $\frac{n^2}{(n+1)!}$  beginning with  $n=1$ .

Solution by L. E. NEWCOMB, Los Gatos, Cal.

The general term  $\frac{n^2}{(n+1)!} = n\left(\frac{1}{n!} - \frac{1}{(n+1)!}\right)$ . Set  $n=1, 2, 3, \dots$  in succession, and the series becomes

$$1 - \frac{1}{2} + \frac{2}{2!} - \frac{2}{3!} + \frac{3}{3!} - \frac{3}{4!} + \dots = 1 + \frac{1}{2!} + \frac{1}{3!} + \frac{1}{4!} + \dots = e - 1.$$

Also solved by G. W. Greenwood, J. Scheffer, and the Proposer.

#### AVERAGE AND PROBABILITY.

162. Proposed by F. P. MATZ, Ph. D., Sc. D., Reading, Pa.

Two points are taken at random in the surface of a circle and a chord is drawn through them. Find the average area of the segment containing the center of the circle.

Solution by the PROPOSER.

Let  $2\theta$  = the sectoral angle, then the area of the segment in question is  $U = \frac{1}{2}(2\pi - 2\theta + \frac{1}{2}\sin 2\theta)r^2$ .

$$\therefore A = \frac{r^2}{\pi} \int_0^{\frac{1}{2}\pi} U d\theta = \frac{1}{2} \left( \frac{3\pi}{2} + \frac{1}{\pi} \right) r^2.$$

#### CALCULUS.

199. Proposed by F. P. MATZ, Sc. D., Ph. D., Reading, Pa.

If the perimeter of an ellipse varies uniformly at the rate of  $\frac{1}{4}$  inch per unit of time, at what rate is the eccentricity varying the instant the perimeter becomes 60 inches and the major axis 25 inches?

No correct solution for this problem has been received.

200. Proposed by R. D. CARMICHAEL, Hartselle, Alabama.

Find the equation of a curve so that the area bounded by the curve, the axis of  $x$ , and any ordinate  $y$ , is equal to  $y - x$ ,  $x$  being the corresponding abscissa.